

## Summary from Hake MSEWG call on specifying Objectives and Performance Metrics (5/1/2018)

**In attendance:** Kristin Marshall (MSE coordinator), Nis Jacobsen (MSE postdoc), Aaron Berger (JTC), Andy Edwards (JTC), Ian Taylor (JTC), Paul Ryall (JMC), Bruce Turris (JMC), Frank Lockhart (JMC), Dan Waldeck (JMC), Mike Okoniewski (AP), Joe Bersch (AP), Shannon Mann (AP), Michelle McClure (SRG)

Thank you all for participating and sharing your thoughts on the call last week. Please view this document as a reflection of what we (the MSE analyst team) heard and took away from the discussion. It reflects one iteration in an evolving process and is still very much open to more feedback. Based on our discussion, we pulled together a draft table aligning previously stated aspirational goals with potential sub-goals, operational objectives, and performance metrics to be used to evaluate performance of management procedures in the MSE. Note that values or text in brackets in the table indicate that we've interpreted what we heard on the call and/or suggested a starting place for consideration.

Goals	sub-goals (specifies direction)	objectives	performance metric
Manage the Pacific Whiting resource in a precautionary and sustainable manor	minimize risk of severe overfishing and closing the fishery	the population is above 10 percent of unfished biomass in 95 percent of the years over a 30 year period	percent of years (out of 30) that coastwide spawning biomass is above 10 percent of unfished biomass
	minimize the risk of the stock dropping below a threshold that impairs recruitment	the population is above 40 percent of unfished biomass in 75 percent of the years over a 30 year period	percent of years (out of 30) that coastwide spawning biomass is above 40 percent of unfished biomass
	[if the stock drops below a threshold that impairs recruitment, minimize the risk that the stock stays below the threshold for consecutive years]	If the stock drops below [40] percent of unfished biomass, the probability that it stays below the threshold for more than [3] consecutive years is less than [10] percent	the percent of instances that coastwide spawning biomass drops below 40 percent of unfished biomass and remains there for 3 or more consecutive years
Both parties can achieve their intended benefits under the treaty	each country has the opportunity to attain their allocation of the TAC as specified in the treaty	the [exploitable] biomass in Canada during the fishing season is greater than their allocated TAC > [90]	percent of years (out of 30) that Canadian TAC exceeds exploitable biomass in Canada

		percent of years over a 30 year period	
		the [exploitable] biomass in US waters during the fishing season is greater than their allocated TAC > [90] percent of years over a 30 year period	percent of years (out of 30) that US TAC exceeds exploitable biomass in Canada
	[minimize the risk of TACs being set below 180k tons]	[the TAC is set below 180k in less than [10] percent of years over a 30 year period]	percent of years (out of 30) that coastwide TAC <180k tons
	maximize catch	maximize catch in the short-term	percent of years that catch >375 (first 10 years of a 30 year period)
			percent of years that catch >500 (first 10 years of a 30 year period)
		maximize catch in the long-term	percent of years that catch >375 (last 10 years of a 30 year period)
			percent of years that catch >500 (last 10 years of a 30 year period)
	minimize variability in catch	(could set a threshold here if desired)	annual variability in catch

Notes on the table:

- “Exploitable biomass” likely needs to be further refined by the MSE analyst team to capture what the MSEWG is interested in, maybe with a catchability or selectivity correction. We’ll think more about how to represent this in the operating model, and as a metric.
- Multiple biomass-related objectives in this table are stated with respect to reference points that trigger management actions as specified in the current harvest control rule, as stated in the treaty (e.g, B40, B10). However, the point was raised that it is possible to separate out objectives for biomass from the thresholds that trigger reductions in harvest rate, should that be desired by the MSEWG.
- The performance metric for the objective minimizing the risk of the stock dropping below B40 for consecutive years needs further thought from the MSE analyst team on how

best to formulate it (an alternative formulation would be in terms of the trend in SSB if it drops below B40)

Issues raised on the call that aren't captured in the table above

- How does the recommendation the SRG made about weight at age affecting reference points affect the MSE?
  - The JTC is investigating data from the early years of the fishery to better understand how reliable this information is. In August we should be able to report on data available and ideas for ways to explore relative influence of fishing and the environment on changes in weight-at-age. Exploring the trade-offs associated with alternative ways of calculating the B0 reference point could be included in future MSE work.
- Will the operating model be able to inform biomass within Tribal U&A within US waters?
  - At this time, the model boxes represent US and Canadian water. We are thinking to the future with respect to spatial resolution though, and considering ways we could include more resolution either explicitly or implicitly.
- Phrasing objectives in terms of economic viability was not desired

**Based on the table and our discussion on the call:**

- Are any objectives or performance metrics missing from this list?
- Are the objectives and performance metrics represented at the right time scales (short or long term) and spatial scales (coast-wide vs country-specific)?
- Do you have suggestions for modifications to any of the thresholds or risk probabilities?